27. The combination of claim 21 wherein said helical tubular reaction chamber has maximum tube wall temperatures ranging from 1300°F to 1600°F, when heated by said radiant burner, in operation.

28. The combination of claim 21 wherein said helical tubular reaction chamber has average heat fluxes ranging from 3,000 btu/ft^2/h to 10,000 btu/ft^2/h, when heated by said radiant burner in operation.

29. The combination of claim 21 wherein said helical tubular reaction chamber is sized to have capacity to generate hydrogen plus carbon monoxide product in volumetric quantities ranging from 50 SCFH to between 100 and 1500 SCFH.

30. The combination of claim 21 wherein said radiant burner comprises a supported porous ceramic material having extended life at operating temperatures up to 2100°F.

31. The combination of claim 21 wherein said radiant burner comprises a supported metal fiber material consisting essentially of an alloy containing principally iron, chromium, and aluminum and smaller quantities of yttrium, silicon, and manganese, said alloy having extended life at operating temperatures up to 2000°F.

32. The combination of claim 21 wherein said radiant burner is configured to radiate heat energy in a substantially uniform radial pattern.

33. The combination of claim 21 wherein said radiant burner has surface temperatures ranging between 1500°F and 1900°F, in operation.

34. The combination of claim 21 wherein said radiant burner has an operating combustion intensity typically ranging from 150,000 btu/ft^2/h to 350,000 btu/ft^2/hr, wherein the combustion intensity is defined as the higher heating value of the fuel combusted divided by the permeable radiant burner surface area.

35. The combination of claim 21 wherein said radiant burner has an operating excess air ratio typically ranging from 30% to 100%, wherein the excess air ratio is defined as percent combustion air in excess of the stoichiometric amount required for complete combustion of the burner fuel.

36. The combination of claim 22 wherein the coil has free area in the range 50% to 75%, wherein the free area is defined as the ratio of the free area between successive coil turns and the cylinder that bisects the helical coil circle.

37. The combination of claim 21 wherein the convection chamber has an inlet within the combustion chamber, and an outlet outside the combustion chamber.

38. The combination of claim 1 including a fuel cell in operating communication with said reaction chamber, to receive hydrogen therefrom.